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Ruta graveolens plant: A plant with a range of high therapeutic effect called cardiac plant

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INTRODUCTION

Belonging to the family Rutaceae, Rue or *Ruta graveolens* L. (RG) is an evergreen shrub herb and is distributed all around the world. From the ancient times, the herb is applied for various types of disorders [1]. In Iran, RG is known as *Pim* or *Sodab* and generally grows in the northern parts as Gilan province and Rasht city [2]. Concurrent with other traditional systems of medicine, RG has been administered for numerous types of diseases in Traditional Persian Medicine (TPM). Avicenna, the outstanding Persian physician, believed that RG have antispasmodic, anti-inflammatory, analgesic and antihelmintic effects and also exhibit aphrodisiac activity. In addition, this natural medicament has been administered in gastrointestinal, pulmonary and genecology disorders [3]. Later Persian scholars have recommended the herb as a vasodilator, antiflatulent, diuretic and a herb to treat amenorrhea and dysmenorrhea. Moreover, leaves of RG have been applied as an appetizer, a medicament for skin disorders, sciatalgia, chill and fever, kidney stones, toxins and poisons, neurological disorders and also a flavor to control the taste and odor of syrup dosage forms [4].

The herb is also widely used in other medical systems. Chinese and Indian traditional physicians applied the herb for syncope, neuralgia, rheumatalgia and ascites. However the application has been contraindicated in abortions and pregnancies [5]. Traditional healers in some Latin America countries such as Uruguay and Mexico applied the herb for abortion and GI disorders and cardiovascular system [6-7]. The abortive effect, menstruation function and management of dyspepsia in veterinary medicines are also other applications of RG in some countries or states such as Trinidad, Tobago and British Colombia of Canada [8]. Furthermore, African traditional practitioners have used RG dry leaves for urinary ailments, diabetes, headache, and GI disorders and cardiovascular system [9]. British and Denmark traditional medicines report the antirheumatic, tranquilizing and memory enhancing effects and cardiovascular disorders of the herb [10-11].

With reference to current knowledge, RG showed antitumor activity against Dalton's lymphoma ascites (DLA), Ehrlich ascites carcinoma (EAC) and L929 cells (IC100 = 16 mg/ml) which may be related to prooxidant and hydroxyl radicals scavenging activities of the extract [12]. The extract has also evaluated in some neurological disorders such as multiple sclerosis which was found effective [13]. Additionally, the genus, *Ruta* has shown

hypnotic, anticonvulsant and anti-anxiety properties [14] and also could inhibit and destroy the growth of cancer cells [15]. The herb also possessed analgesic, anti-inflammatory and moderate antimicrobial activities [16-17]. In the field of cardiology, RG revealed to have hypotensive activity as well as inotropic and chronotropic effects in animal models [18]. The antifertility effects of RG roots, leaves and stem were assessed intragastrically and resulted in the respective activity [19]. In an animal study and compared to the control group, RG aqueous extract reduced the count of spermatocytes and spermatids at a dose of 500 mg/kg for 60 days [20].

Different parts of RG plant contain numerous secondary metabolites such as glycosides, quinoline alkaloids, coumarins, lignans, flavonoids, furanocoumarins, hydroxycoumarins, and hydrocarbons [21-23].

Despite all these pharmacological and clinical properties, RG may cause photosensitization and photodermatosis due to furanocoumarins as well as gastric inflammation, hypothermia and metritis [2]. The herb also is forbidden in pregnancy due to epigastric pain, vomiting, liver and kidney damage, tremor and spasm [24]. Medicinal herbs are always a source to treat diseases such as cardiovascular, nervous and ect[25-27].

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